Date: Thu, 9 Sep 93 04:30:22 PDT
From: Ham-Homebrew Mailing List and Newsgroup <ham-homebrew@ucsd.edu>
Errors-To: Ham-Homebrew-Errors@UCSD.Edu
Reply-To: Ham-Homebrew@UCSD.Edu
Precedence: Bulk
Subject: Ham-Homebrew Digest V93 #37
To: Ham-Homebrew

Ham-Homebrew Digest   Thu, 9 Sep 93   Volume 93 : Issue   37

Today's Topics:

Send Replies or notes for publication to: <Ham-Homebrew@UCSD.Edu>
Send subscription requests to: <Ham-Homebrew-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Homebrew Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-homebrew".

Date: Wed, 8 Sep 1993 04:05:42 GMT
From: raven.alaska.edu!floyd@decwrl.dec.com
Subject: 311-A/B vaccuum tube info wanted.please?
To: ham-homebrew@ucsd.edu

In article <1993Sep7.203348.15541@cyphyn.UUCP> randy@cyphyn.UUCP (Randy) writes:
>I need the filament voltage, current rating for the antique tube, so to get
>it into a working 1 tube receiver.

The 311 is a Western Electric tube, and probably has a 24 volt filament.

At one time any toll office (long distance Toll Center) would have had
dozens of them in the carrier systems and I think they were also used
as the control amplifier in some of the battery plant rectifiers.

But, alas... I looked in all the dark corners today at work and I can't
find one dusty old scrap of info on a 311 anymore! I know that as recent
as two years ago we had some old tube manuals hidden away, and maybe it
was only about 3-4 years ago that the last piece of junk^H^H^H^H equipment
using them got turned off.

The 310 and the 311 were both used in "L" carrier systems, but I can't remember which tube is which. I think both of them had 24 volt filaments, but were commonly operated at 12 volts in WECO equipment. The result was that they just didn't ever fail! I know positively that I saw some that had not been changed in 25 years.

I would suggest that looking in a fair sized library might turn up some information...

--
floyd@ims.alaska.edu A guest on the Institute of Marine Science computer
Salcha, Alaska system at the University of Alaska at Fairbanks.

Date: Fri, 3 Sep 1993 23:05:04 GMT
From: dog.ee.lbl.gov!agate!spool.mu.edu!sdd.hp.com!col.hp.com!news.dtc.hp.com!srgenprp!glenne@network.ucsd.edu
Subject: How do Vector Impedance Meters Work?
To: ham-homebrew@ucsd.edu

Alan Bloom (alanb@sr.hp.com) wrote:
: Gary Bishop (gb@dixie.cs.unc.edu) wrote:
: : Can anyone point me to a reference that describes how commercial
: : "vector impedance meters" work?

: This is a guess, so take it for what it's worth: I think a vector
: impedance meter is basically a 1-port vector network analyzer. It
: measures the relative amplitude and phase of a signal going into the
: device under test and calculates the impedance from that.

  I think it is fair to say that vector impedance meters are a special case of vector network analyzers. Perhaps it depends upon your context but I generally think of an impedance meter (vector is implied) as a low frequency case of a vector network analyzer. What is special about the low frequency case is that it may be possible to build sufficiently good voltage and current sources and probes such that their contribution to the measurement error is acceptably small.

  The problem is indeed in the circuitry which connects the device to be measured to the measuring equipment. Beyond fairly low frequencies and minimal precision, approaches which consider the characteristics and effect of the measurement equipment and environment upon the device to be measured must be used. As Al suggests, this is most often in the form of a network analyzer using error correction.

The connections to the device are made by way of a transmission line or medium. These connections are in actuality always with some kind of distributed network (the connections) but at low frequencies they were considered to be lumped elements or else ignored. The characteristics of the measurement hardware are first measured and then used to remove errors from the measured data. The process of measuring the measurement hardware is known as "calibration" and involves some combination of known physical devices, generally of the same general size and interface/connector type as the device under test (DUT). There are many different calibration techniques but one of the oldest ones involve the use of precision open circuits (with fringing effects included), short circuits and terminations (of the same characteristic impedance as the measurement environment). This is referred to as an OST or OSL (open,short,termination or open,short,load) calibration. Thes precision known devices are known as calibration standards.

If these standards' impedances/characteristics are accurately known, the measured values may be used to solve equations which can produce "error terms" which describe the measuring hardware. This hardware often consists of a signal source followed by a directional device (directional couplers or bridges are most common). Along with the description afforded by the error terms, a virtual analyzer which is error free (given some assumptions of single-mode, linear systems, etc) can be mathematically constructed. The actual measured data can be suitably processed to view the DUT as it would look if viewed/measured from a virtual machine which was perfect.

The measurement is thus made on the DUT in a known impedance system by a near-perfect virtual measuring tool.

At the hardware level, this is basically a stimulus-response measurement and may be via a single port as Al suggested or two or more ports depending upon the DUT. Since the signals can be completely separated (mathematically at least) into forward/stimulus and reverse/response components, the DUT can be completely described. Although at high frequencies this is most often done using S parameters, other formats like SWR, group delay and real/imaginary (impedance or admittance) are directly available as well. The two signals are generally downconverted to some convenient IF and then synchronously demodulated (IQ demodulators do this). The comparison (ratio) of the I and Q (real&imaginary) components of the stimulus and response provide characterization of the DUT.

There is at least one other technique for making complex measurements of devices not requiring synchronous detection and using only scalar detectors. This technique called a "six port measurement" and requires an increased amount measrement hardware and computation and is generally more complex and slower.

Much of the ongoing work in network measurement involves calibration techniques and devices.

Gary, I'm not sure what further level of detail you might want WRT measurement hardware but I'll be glad to try to provide it if I can. There are a number of publications covering many of the above processes.

73

Glenn Elmore n6gn

N6GN @ K3MC
amateur IP: glenn@SantaRosa.ampr.org
Internet: glenne@sr.hp.com

Date: Tue, 7 Sep 1993 20:20:39 GMT
From: dog.ee.lbl.gov!agate!howland.reston.ans.net!vixen.cso.uiuc.edu!uchinews!att-out!cbnewsh!wa2sff@network.ucsd.edu
Subject: Sources of blank PC boards
To: ham-homebrew@ucsd.edu

I am ready to etch a board for a RF project I have
designed and I need a source of blank PC boards.
Radio Shack has one double sided board.
I need a 6x6" single sided board.
Anyone have any sources? Mail order is fine.

Joe Wilkes
j.e.wilkes@att.com

Date: 8 Sep 93 14:44:58 GMT
From: ogicse!uwm.edu!math.ohio-state.edu!darwin.sura.net!udel!newsserv.cs.sunysb.edu!rick@network.ucsd.edu
To: ham-homebrew@ucsd.edu

References <26gioo$5jb@hobbes.cc.uga.edu>, <1993Sep7.165750.16867@kocrsv01.delcoelect.com>, <CD1G07.Fyx@inmet.camb.inmet.com>
Subject : Re: What kits would you like to see?

Bill White (bwhite@cobra.camb.inmet.com) wrote:
: >Now, if we could only get them to stock "Dual Gate MOSFETs", like the
: >ones that seem to appear in every mixer/oscillator circuit in the ARRL
: >Handbook (& "Solid State Design for Radio Amateurs") but are fading

: >into rare existance . . .

    [text deleted]

: She pointed out to me: If people used
: to use these, then they were solving a problem. Either the problem
: has gone away, or they solve it with other parts now. "They" means
: grown-ups in this case. So, what do grown-ups do for mixers and
: oscillators?

    Dual gate mosfets are still used in television tuners;
    one typically uses the second gate to achieve AGC. I think it
    was a recent RF design which mentioned one manufacturer which
    introduced a dual gate mosfet for use in RF apps, ie AGC amps.
    The original poster might do well to take a look through the
    Phillips RF discrete semiconductor catalog for dual gate fets.

:   Bill White, N1OSA

                  Rick Spanbauer
                  SUNY/Stony Brook

Date: Tue, 7 Sep 1993 16:57:50 GMT
From: dog.ee.lbl.gov!agate!spool.mu.edu!caen!rphroy!kocrsv01!
c2xjcb@network.ucsd.edu
To: ham-homebrew@ucsd.edu

References <26dc08INNl6r@rave.larc.nasa.gov>, <1993Sep6.175252.6021@cyphyn.UUCP>,
<26gioo$5jb@hobbes.cc.uga.edu>
Subject : Re: What kits would you like to see?

In article <26gioo$5jb@hobbes.cc.uga.edu>, mcovingt@aisun3.ai.uga.edu (Michael
Covington) writes:
> I *did* do *one* thing for the good of the hobby, though; I persuaded
> Digi-Key to carry the NE602. That's my one good deed for electronics...
>
>
> --
> :- Michael A. Covington, Associate Research Scientist   :   *****

Now, if we could only get them to stock "Dual Gate MOSFETs", like the
ones that seem to appear in every mixer/oscillator circuit in the ARRL
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into rare existance . . .

--
James C. Bach Ph: (317)-451-0455 The views & opinions expressed
Advanced Project Engr. GM-NET: 8-322-0455 herein are mine alone, and are
Powertrain Strategy Grp Amateur Radio: WY9F NOT endorsed, sponsored, nor
Delco Electronics Corp. Just say NO to UNIX! encouraged by DE or GM.

Date: Wed, 8 Sep 1993 13:55:18 GMT
From: dog.ee.lbl.gov!agate!howland.reston.ans.net!noc.near.net!inmet!cobra!bwhite@network.ucsd.edu
To: ham-homebrew@ucsd.edu

References <1993Sep6.175252.6021@cyphyn.UUCP>, <26gioo$5jb@hobbes.cc.uga.edu>, <1993Sep7.165750.16867@kocrsv01.delcoelect.com>
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>ones that seem to appear in every mixer/oscillator circuit in the ARRL
>Handbook (& "Solid State Design for Radio Amateurs") but are fading
>into rare existance . . .

I asked my wife about this last night. She's a EE and an electronics manufacturing engineer, though analog and RF electronics is not her specialty. (She thinks I'm a lunatic for futzing around with discrete, through-hole parts. She doesn't understand how anybody could even think of doing something other than surface mount technology with big machines and parts on reels.) She pointed out to me: If people used to use these, then they were solving a problem. Either the problem has gone away, or they solve it with other parts now. "They" means grown-ups in this case. So, what do grown-ups do for mixers and oscillators? Do they use synthesized oscillators using PLLs on chips? Mouser and Digi-Key have PLL chips for small funds (under $3.00). Do they use Mini-Circuits mixers?

Danny's Small Parts and Kits still sells dual gate mosfets, and he advertises them as replacements for 40673s, which have been put out of their misery by RCA. I just got his latest flier last night. It's very exciting, but then, my wife is probably right, and I'm a lunatic. Digi-Key and Mouser advertise NTE222s, which NTE claims as a substitute for the 40673. I don't know if they actually stock these, but they are in the catalog. They cost about $3.90 per each.

Hope this helps.

Peace
Bill White, N1OSA

Date: 9 Sep 93 05:49:42 GMT
From: ogicse!uwm.edu!cs.utexas.edu!csc.ti.com!tilde.csc.ti.com!mksol!
blair@network.ucsd.edu
To: ham-homebrew@ucsd.edu

References <1993Sep5.143628.13664@ke4zv.atl.ga.us>,
<1993Sep7.033320.28801@mksol.dseg.ti.com>, <1993Sep7.134439.22935@ke4zv.atl.ga.us>
Subject : Re: NASA select rcvr

Gary Coffman (gary@ke4zv.atl.ga.us) wrote:
: SOTA was a 120 degree LNA feeding low loss cable to a single conversion
: receiver with a 70 MHz IF and FM detector. Few people still use anything
: so crude. Most systems now use a 15 to 30 degree LNB at the feedpoint

 Forgive my ignorance but... 120,15,30 degree? Do you mean beamwidth or
Noise temperature or something else?

: a tunable stage to convert down to the 70 MHz IF and FM detector. A 6
: foot dish with offset feed is pretty much standard now instead of the

 offset feed?

: C band satellites. If you also want Ku band, you need a dish with a finer
: surface finish than most of the fiberglass over chicken wire models being
: sold. A spun aluminum dish is a better choice in this case. You use the

Since I'm literally only interested in 1 channel do you think the old LNA/
single conversion receiver would be sufficient? NASA select is C band.
Since it sounds obsolete maybe I can get a deal on a dish/LNA combo.
I'd like to keep the dish small though, since it'll probably
have to sit on the roof to see low enough south. Whats the typical
noise figure for the old LNA systems? Maybe I can do better with
a narrow band LNA with a good enough noise figure to keep the
dish small.?. Did they ever make small C band dishes/feeds?
Art.

End of Ham-Homebrew Digest V93 #37
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